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Quebec Region

Proceedings of the Regional Peer Review Meeting on the Assessment of the Estuary and Northern Gulf of St. Lawrence Snow Crab Stocks

February 17 and 18, 2014
Mont-Joli, Quebec

Chairperson: Denis Chabot
Rapporteur : Sonia Dubé

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Canada

Foreword

The purpose of these Proceedings is to document the key activities and discussions of the meeting. The Proceedings may include research recommendations, uncertainties and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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SUMMARY

This document contains the proceeding from the meeting held within the regional assessment process on Snow crab in the Estuary and Northern Gulf of St. Lawrence. This review process was held on February 17-18, 2014 at the Maurice Lamontagne Institute in Mont-Joli. This meeting gathered about fifty participants from sciences to management to industry. This proceeding contains the essential parts of the presentations and discussions held and relates the recommendations and conclusions that were presented during the review.

SOMMAIRE

Ce document renferme le compte rendu de la réunion tenue dans le cadre du processus régional d'évaluation des stocks de crabe des neiges de l'estuaire et du nord du golfe du Saint-Laurent. Cette revue, qui s'est déroulée les 17 et 18 février 2014 à l'Institut Maurice-Lamontagne à Mont-Joli, a réuni près d'une cinquantaine de participants des sciences, de la gestion et de l'industrie. Ce compte rendu contient l'essentiel des présentations et des discussions qui ont eu lieu pendant la réunion et fait état des recommandations et conclusions émises au moment de la revue.

INTRODUCTION

The Quebec Region of the Department of Fisheries and Oceans (DFO) is responsible for assessing the stocks of several exploited fish and invertebrate species in the Estuary and Gulf of St. Lawrence. Most of these stocks are assessed periodically within a regional advisory process, which is conducted at the Maurice Lamontagne Institute in Mont-Joli. This document consists of the proceedings of the meeting held on February 17-18, 2014 on the assessment of the Estuary and northern Gulf of St. Lawrence Snow Crab stock.

The objective of the review was to determine whether there were any changes in the resource's status and whether adjustments were required to the management plans based on the chosen conservation approach, the ultimate goal being to provide scientific advice on managing the Snow Crab stock in the Estuary and northern Gulf of St. Lawrence for the 2014 fishing season.

These proceedings report on the main points discussed in the presentations and deliberations stemming from the activities of the stock assessment regional committee. The regional review is a process open to all participants who are able to provide a critical outlook on the status of the assessed resources. In this regard, participants from outside DFO are invited to take part in the committee's activities within the defined terms of reference for this review (Appendices 1 and 2). The proceedings also focus on recommendations made by the meeting participants.

CONTEXT

Meeting chairperson Denis Chabot welcomes the participants. He goes over the objectives of the peer review and how it will proceed. Stock assessment biologist Jean Lambert begins his presentation by recognizing the work of his colleagues. He presents landings elsewhere in the world and provides a more detailed overview of the fishery in the Estuary and northern Gulf of St. Lawrence. There are 162 fishers in nine areas: 12A, 12B, 12C, 13, 14, 15, 16, 16A and 17. Area 16 represents a significant portion of landings. The conservation principle that applies to these areas targets the protection of reproductive potential. Management measures include limits imposed on catches via a total allowable catch (TAC), effort controls (number of traps, number of licenses and fishing season) and a minimum catch size set at 95 mm. In addition, the fishery is closed when catches in one area include more than 20% white crab.

The data used in the assessment are mainly from the fishery (ZIFF and logbooks, commercial sampling) and independent sources (post-season survey, trawl survey). These data provide the key indicators, including the commercial catch per unit effort (CPUE), changes in average carapace condition, the exploited portion, post-season number per unit effort (NUE), prospects for recruits/adolescents and crab left by the fishery, average size and size frequency, and a combined biomass index (CPUE and NUE). This index was created as part of the development of a precautionary approach, but it is used in the same way as the other indicators in this review.

ASSESSMENT OF THE RESOURCE

Mr. Lambert reviews the key indicators for each fishing area and a summary is presented. The participants put forward some questions and comments, and a recommendation for the 2014 fishing season is made.

AREA 16

Indicators

The TAC increased by 25% to 4606 t between 2012 and 2013 and was reached. The catch rate increased during the 2013 commercial fishery and is well above average. Landings have consisted primarily of recruits since 2006.

The post-season survey suggests that there will be more biomass available to the fishery in 2014 than there was in 2013 and that the proportion of intermediate-shell crabs will be higher.

The combined commercial CPUE and post-season NUE index is at its highest level.

The size of crabs caught in the commercial fishery has changed little since 2011 and remains well above average. It should remain high in 2014 according to the post-season survey.

The post-season survey indicates above-average recruitment and abundance of adolescents ≥ 78 mm, suggesting that strong recruitment will continue in the short term.

The increase in the combined index, continued strong recruitment and the increase in the residual biomass suggest that catches could be increased in 2014 without creating an excessively high harvesting intensity. According to the trawl survey conducted in the western part of the area, recruitment to the fishery could decrease as of 2015 or 2016.

- It is explained that the combined index is determined based on the average of the two biomass indices (CPUE and NUE). The delta represents the index's variation from the previous year. According to some participants, if this indicator is mentioned in the report summary, it must be clearly explained in the report with an accompanying graph. However, according to another participant, presenting graphs of both indicators separately in the report provides information that is more detailed than it would be if only the combined index graph were presented.
- A few time discrepancies are noted between the two indices, but by and large, it is agreed that the trends are similar enough and that it is still better to consider the average of both indices than just one index in the assessment.
- The participants view a 15 to 20% increase in the TAC as appropriate for 2014. However, it must be understood that recruitment to the fishery could decrease in the coming years.

Recommendation – Area 16

A 15 to 20% increase in the 2013 TAC for 2014 would not result in an excessively high harvesting intensity.

AREA 12B

Indicators

The TAC increased by 20% to 390 t between 2012 and 2013 and was reached. The commercial fishery catch rate increased and is at the highest value in the series. Landings consisted primarily of intermediate-shell crabs.

The post-season survey suggests that there will be more biomass available to the fishery in 2014 than there was in 2013 and that the proportion of intermediate-shell crabs will be higher.

The combined commercial CPUE and post-season NUE index is at its highest level.

The size of crabs caught in the commercial fishery was stable and well above average between 2012 and 2013. It may decrease in 2014 according to the post-season survey, but to a level that is still high.

The 2012 post-season survey indicates above-average recruitment and abundance of adolescents ≥ 78 mm, suggesting that strong recruitment will continue in the short term.

The increase in the combined biomass index, continued recruitment and the increase in the residual biomass suggest that catches could be increased without creating an excessively high harvesting intensity.

- It is explained that for Area 12B, crab is purchased based on weight without considering quality; this could have an impact on CPUE.
- According to a number of Science representatives, the data suggest that catches could be increased by about 40%.
- The industry is concerned that this significant increase will result in major decreases in the medium term and, preferring a more conservative approach, proposes a 20% increase.
- The situation is at an unprecedented level and there is uncertainty as to what will happen next. Recruitment may not be all that promising, so some participants also believe that it is essential to remain prudent. There are few fishers in this area, and CPUE can fluctuate quickly.
- The participants agree to a 20 to 25% increase, which is consistent with the increases in recent years.

Recommendation – Area 12B

A 20 to 25% increase in the 2013 TAC for 2014 would not result in an excessively high harvesting intensity.

AREA 12A

Indicators

The TAC increased by 7.5% to 174 t between 2012 and 2013 and was reached. The commercial fishery catch rate increased in 2013 and is well above average. Landings consisted primarily of intermediate-shell crabs.

There was no post-season survey in 2013.

The size of crabs caught in the commercial fishery decreased but remains well above average.

The only commercial biomass indicator is from the 2013 commercial fishing yields, which indicate an increase. A recruitment index for 2014 cannot be obtained, but the abundance index for adolescent crabs ≥ 78 mm in the 2012 post-season survey was down.

Caution is therefore required when setting catches for 2014.

- The participants believe that there is indeed slightly more uncertainty in the 2013 assessment because it is based solely on the commercial fishery (CPUE).
- An industry representative says that a post-season survey should be conducted in 2014.
- An increase not exceeding 10% is deemed prudent by the participants.

Recommendation – Area 12A

An increase in catches for 2014 that does not exceed the 2013 TAC by more than 10% should not result in an excessively high harvesting intensity.

AREA 17

Indicators

The TAC remained stable at 1809 t between 2012 and 2013 and was reached. The catch rate during the 2013 commercial fishery decreased and is slightly below average. Landings consisted primarily of intermediate-shell crabs.

The post-season survey suggests that there will be less biomass available to the fishery in 2014 than there was in 2013 and that catches will consist primarily of intermediate- and old-shell crabs.

The combined commercial CPUE and post-season survey index decreased and is below average.

The size of crabs caught in the commercial fishery has remained stable and high since 2011, but it should decrease in 2014 according to the post-season survey.

The post-season survey indicates little recruitment and abundance of adolescents ≥ 78 mm. The trawl survey suggests that the start of the next recruitment wave could contribute to catches as of 2015 if, in 2014, a majority of crabs did not undergo a terminal molt at sublegal sizes.

The decrease in the combined index, coupled with low recruitment, suggests that catches should be decreased to prevent an excessively high harvesting intensity.

- Questions are raised about what could explain the greater dispersal observed in recent years. Adding this information to the summary is suggested.
- Some participants believe that the prediction regarding the expected recruitment wave in 2015 is highly uncertain. The post-season survey does not contain an abundance of current data in this regard. It is added that many crabs will still not reach commercial size before their terminal molt, which should have been mentioned in the summary. The low abundance of large individuals in the water (competitors) could explain why adolescents are molting at a smaller size. However, industry representatives believe that they are intimidated by the presence of dominant adults and are therefore more difficult to catch.
- Very different ocean conditions from one area to another could explain the gradient observed in Area 17.
- Given the current data and the uncertainty regarding future recruitment, Science believes that a 25% increase in the 2013 TAC for 2014 would be appropriate.
- The industry representatives consider this decrease to be too much and believe that a 15% decrease would be reasonable. They are more optimistic about recruitment and the presence of white crabs and old crabs.
- The participants ultimately agree to a 20% decrease.

Recommendation – Area 17

A 20% decrease in the 2013 TAC for 2014 is recommended to avoid creating an excessively high harvesting intensity.

AREA 14

Indicators

The TAC increased by 10% to 448 t between 2012 and 2013 and was reached. The catch rate during the 2013 commercial fishery increased and is slightly above average. Landings consisted primarily of recruits.

The post-season survey suggests that there will be more biomass available to the fishery and a higher proportion of intermediate-shell crabs in 2014 than there was in 2013.

The combined commercial CPUE and post-season NUE index is at its highest level.

The size of crabs caught in the commercial fishery, which had been decreasing since 2009, increased slightly in 2013. However, it is still low. It should remain low in 2014 according to the post-season survey.

The post-season survey indicates well above average recruitment and abundance of adolescents ≥ 78 mm, suggesting strong recruitment in the short term.

The increase in the combined index, continued strong recruitment and the increase in the residual biomass indicate that catches could be increased without creating an excessively high harvesting intensity.

- It must be stated that the value in the 2013 post-season survey is at an unprecedented level. The abundance of large adolescents is also quite encouraging in terms of the size of the crabs that will be available to the fishery in a few years.
- It is explained that the high number of crabs left by the fishery in 2013 is probably related to a low exploitation rate.
- In the Gulf of St. Lawrence, a gradient in recruitment is observed from west to east. In addition, oceanographic conditions cause differences in the growth rate from one area to the next. Colder waters in the east generate smaller-size crabs.
- A major concern is raised regarding consistency between areas in terms of stock monitoring via post-season surveys. Monitoring tools, especially trap volume, should be optimal for each area. Standardization across all areas is discussed. Industry representatives believe that Lower North Shore areas are penalized compared to areas farther west. Another factor to consider are the harsh conditions that have prevailed there in recent years—conditions that have an impact on catchability. Questions are also raised about how to consider changes that occur in time (climate change, fishery performance, etc.). Brainstorming on this topic appears essential and will have to take place in another forum.
- Regarding the recommendation for Area 14, an increase of 35 to 45% is suggested first.
- Some concerns are raised about increases of this size, but it is mentioned that increases of this magnitude are going on elsewhere in the world for crab and other species that are recruited to the fishery in waves.
- The participants believe that it is more prudent to go with a maximum increase of 35%.

Recommendation – Area 14

An increase in catches for 2014 that does not exceed the 2013 TAC by more than 35% should not result in an excessively high harvesting intensity.

AREAS 15, 16A AND 12C

The indicators for areas 15, 16A and 12C are reviewed before the respective recommendations are made.

AREA 15

Indicators

The TAC increased by 10% to a new peak of 652 t between 2012 and 2013. The catch rate during the 2013 commercial fishery increased and is well above average. Landings consisted of a slight majority of recruits.

The post-season survey suggests a decrease in 2014 fishing yields.

The combined commercial CPUE and post-season NUE index remained stable.

The size of crabs caught in the commercial fishery slightly decreased, but is still high. It should remain high in 2014 according to the post-season survey.

The abundance index from the post-season survey for adolescents ≥ 78 mm decreased in 2013, but has still been above average since 2011, suggesting good recruitment in the short term.

Maintaining the combined index suggests that catches could be kept at 2013 levels for 2014 without creating an excessively high harvesting intensity.

- The industry expresses some concern about the reliability of the 2013 post-season survey data. With regard to the number of crabs left by the fishery and recruits, the theory of a possible misreading the carapace condition is raised.
- Some Science representatives believe that the trends in both series (CPUE and NUE) are consistent, and the representatives have more faith in the 2013 post-season survey result.
- Science proposes the status quo, but the industry believes that current data should make a TAC increase possible.

AREA 16A

Indicators

The TAC increased by 10% to a new peak of 468 t between 2012 and 2013 and was reached. The catch rate during the 2013 commercial fishery increased slightly and is near average. Landings consisted of a slight majority of recruits.

The post-season survey suggests that there will be slightly less biomass available to the fishery in 2014 than there was in 2013 and that landings will consist of an equal proportion of recruits and intermediate-shell crabs.

The combined commercial CPUE and post-season NUE index changed little and is near average.

The size of crabs caught in the commercial fishery slightly increased and is well above average. It should remain high in 2014 according to the post-season survey.

The post-season survey indicates a high abundance of recruits and a decrease in adolescent crabs ≥ 78 mm to a near average value. These indicators suggest continued good recruitment in 2014.

The stability of the combined index and continued recruitment suggest that catches could remain unchanged without creating an excessively high harvesting intensity.

- Science proposes the status quo, but the industry believes that a 10% increase would be possible. The industry says that this area is an overflow area of Area 16, for which a TAC increase was recommended.

AREA 12C

Indicators

The TAC increased by 10% to a new peak of 352 t between 2012 and 2013 and was reached. The catch rate during the 2013 commercial fishery slightly increased and is near average. Landings consisted of a slight majority of recruits.

The post-season survey suggests that there will be less biomass available to the fishery in 2014 than there was in 2013 and that landings will consist primarily of intermediate-shell crabs.

The combined commercial CPUE and post-season NUE index decreased and is near average.

The size of crabs caught during the 2013 commercial fishery fell below average. It should remain low in 2014 according to the post-season survey.

The post-season survey indicates a slight decrease in recruits, and stability in the abundance of adolescent crabs ≥ 78 mm; each is near average.

The decrease in the combined index and near average recruitment suggests a decrease in catches for 2014.

- Science proposes a 10% decrease, but the industry proposes the status quo.

General discussion: areas 15, 16A and 12C

- Industry representatives question the reliability of the post-season survey; they think that less weight should be put on it.
- However, Science representatives believe that it is still better to use the average of the two indices (CPUE and NUE) in order to reduce the uncertainty present in each series.
- The importance of considering all factors that may impact the data and the changes that these factors undergo over time is restated: fishing tools and techniques, weather and oceanographic conditions, fishers' experience, etc. The participants agree that a brainstorming session needs to be conducted on this topic in another forum.
- With regard to the post-season survey, Management says that a discussion needs to be held to establish how to proceed in the coming years. However, Science reminds participants that any change in the way things are done could cause a break in the historical series.
- Lastly, regarding the recommendations for areas 15, 16A and 12C, the participants agree on wording that reconciles the various opinions.

Recommendation – Area 15

Maintaining the combined index suggests that a catch level similar to 2013 could be applied in 2014.

Recommendation – Area 16A

Maintaining the combined index suggests that a catch level similar to 2013 could be applied in 2014.

Recommendation – Area 12C

The status quo or a 10% decrease in the 2013 TAC for 2014 is recommended.

AREA 13

Indicators

The TAC increased by 11% to 188 t between 2012 and 2013 and was reached. The commercial fishery catch rate for 2013 increased and is above the 1988–2012 average. Fishing effort was much greater in the southern part of the area. Landings consisted of a slight majority of intermediate-shell crabs, and the proportion of recruits has been growing since 2010.

The post-season survey in the northern part suggests a slight decrease in the biomass available to the 2014 fishery, whereas the post-season survey in the southern part suggests an increase. In addition, if the fishing effort remains greater in the south, landings would still consist primarily of intermediate-shell crabs.

The combined commercial CPUE and post-season NPUE index increased.

The size of crabs caught in the commercial fishery decreased, but is still slightly above average and according to the post-season surveys in the north and south, it will change little in 2014.

The post-season survey in the northern part indicates a decrease in recruitment, but to a value that is still high, and a decrease in adolescents ≥ 78 mm to a slightly above average value. In the southern part, the post-season survey indicates a slight increase in recruits and adolescents ≥ 78 mm, but to values that are still well below average.

The increase in the combined index and the continued recruitment of legal-sized crabs in the northern part suggest that catches could be increased without creating an excessively high harvesting intensity.

- Questions are raised about whether or not to keep the 2006 CPUE, which comes from an index fishery.
- A 35% increase is initially suggested.
- The participants agree to increase catches, but industry and Science representatives believe the proposal is too high. A 20% increase would be more prudent.
- It is also important not to focus effort on the southern part of the area. Fishers do not see this as a problem given that the northern part is more accessible.
- The final consensus is to recommend a 25% increase.

Recommendation – Area 13

A 25% increase in the 2013 TAC for 2014 would not result in an excessively high harvesting intensity.

RESEARCH IDENTIFICATION AND PRIORITIZATION

In regards to the research priorities, the following is recommended:

- Develop a precautionary approach (priority);
- Improve the post-season survey in terms of standardization of tools (e.g. traps);
- Extend the trawl survey to other areas in order to obtain a spermatheca load index (reproductive potential);
- Continue the work on experimental traps.

APPENDIX 1- PARTICIPANTS LIST

Name	Affiliation	Day 1	Day 2
Bourassa, Luc	Biologist consultant	x	x
Bourdages, Hugo	DFO – Science	x	x
Brassard, Claude	DFO – Science	x	x
Briand, Yann	Fisher area 16	x	
Castonguay, Martin	DFO – Science	x	
Chabot, Denis	DFO – Science	x	x
Cloutier, Yvan	Fisher area 16	x	
Cotton, Allen	ACPG	x	
Cyr, Charley	DFO – Science	x	x
Dallaire, Jean-Paul	DFO – Science	x	x
Desgagnés, Mathieu	DFO – Science	x	x
Doucet, Marc	Fisher area 17	x	x
Dubé, Sonia	DFO – Science	x	x
Dubois, Serge	MAPAQ	x	x
Duguay, Guy	Fisher area 12B	x	
Duplisea, Daniel	DFO – Science	x	x
Dupuis, Mario	RPPNG	x	
Gauthier, Johanne	DFO – Science	x	x
Gauthier, Sylvain	Fisher area 16	x	
Giard-Leroux, Andrée	Observer, UQAR	x	
Gilbert, Michel	DFO – Science		x
Gionet, Paolo	Fisher area 16	x	
Gosselin, Claude	Fisher area 17	x	
Joncas, Jean-Richard	Fisher OFBS	x	x
Labrie, David	Fisher area 12B	x	
Labrie, Luc	Fisher area 12A	x	
Lacasse, Olivia	Observer, UQAR	x	
Lambert, Yvan	DFO – Science	x	x
Lambert, Jean	DFO – Science	x	x
Landry René	Fisher area 17	x	
Légaré, Benoît	DFO – Science	x	x
Léonard, Pierre	CPNIE	x	
Lévesque, Marcel	Observer, UQAR	x	
Monger, Marc	Fisher area 14		x
Morin, Bernard	DFO- Fishery management	x	x
Morneau, Renée	DFO – Science	x	x
Nadeau, Paul	APBCN/LNSFA	x	x
Pinette, Majoric	Conseil des Innus Pessamit	x	
Rail, André	Fisher area 16	x	
Sainte-Marie, Anne-Sophie	Observer, UQAR	x	
Sainte-Marie, Bernard	DFO – Science	x	x
Saint-Gelais, Martin	DFO- Fishery management	x	x
Sandt-Duguay, Emmanuel	AGHAMM	x	
Stubbert, Curtis	Fisher area 15/LNSFA	x	x
Thibeault, Sébastien	Malécite de Viger	x	
Top, Moth	Observer, UQAR	x	
Trottier, Steve	DFO – Science	x	x
Vigneault, Guy	Fisher area 16	x	

APPENDIX 2- TERMS OF REFERENCE

ASSESSMENT OF THE ESTUARY AND NORTHERN GULF OF ST. LAWRENCE SNOW CRAB STOCKS

Regional Peer Review - Quebec Region

February 17-18, 2014
Mont-Joli, Québec

Chairperson: Denis Chabot

Context

The snow crab fishery in the Estuary and the northern Gulf of St. Lawrence began in the late 1960s. Landings have varied depending on the adjusted Total Allowable Catches (TACs) based on the recruitment waves and troughs. In 2012, landings have totaled 7,866 t, up slightly from 2011.

The Estuary and northern Gulf of St. Lawrence are divided into nine management areas (13 to 17, 16A, 12A, 12B and 12C). The effort is controlled by a fishing season and catches are limited by quotas.

The resource is assessed each year to determine whether changes that have occurred in the stock status necessitate adjustments to the conservation approach and management plan.

Objectives

Provide scientific advice to determine TACs for the snow crab stocks in the Estuary and northern Gulf of St. Lawrence: management units 13 to 17, 12A, 12B and 12C for the 2014 fishing season. The advice shall include:

- Description of the biology of the snow crab in the Estuary and northern Gulf of St. Lawrence;
- Description of the fishery including landings, fishing effort, carapace condition, size structure and mean carapace width for males;
- Analysis of catches per unit effort from the fishery;
- Analysis of data from post-season trap surveys conducted annually in collaboration with fishers. Indicators: number per unit of effort (NPUE) of legal-size and sub-legal-size crabs, size, spermatheca load and carapace condition of males;
- Analysis of data from trawl survey(s) conducted annually in certain sectors or areas. Indicators: abundance index of legal-size and sub-legal-size males, maturity, size of both males and females;
- Identification and prioritization of research projects to be considered for the future;
- Perspectives and/or recommendations on management measures in effect for the 2014 fishing seasons based on a summary table of main indicators for the precautionary approach and short- and medium-term predictions.

Expected Publications

- Canadian Science Advisory Secretariat (CSAS) Science Advisory Report on snow crab of the Estuary and Northern Gulf of St. Lawrence;
- CSAS Proceedings summarizing the discussion.

Participation

- Fisheries and Oceans Canada (DFO) Science and Fisheries Management
- Fishing industry
- Provincial representatives
- Aboriginal Communities / Organizations